



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200
Fax 613 632-5246



D212-664-101TRN
Job Sheet 204292



Part No: D212-664-101TRN Job Qty: 1 pcs

Part Name: Crosstube Turning Detail



Part Weight: 0 lbs Status: New Priority: Medium

Job Created: 12/5/19 Job Tracking No:

Due Date: 12/27/19 Created By: Marie Lajeunesse

Type: Stock Description:

Note: DWG REV E IPP Rev:A 08-03-06 new issue DD verified by:ec IPP Rev B 08.04.02 removed Polish EC verified by: DD

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
100	Mori Seiki TL-40 - 1	1 pcs		12/27/19	1.00	2.38	Mori Seiki TL-40 - 1		JB 12/11/19
110	QC 2	1 pcs		12/27/19	0.00	0.00	QC 2 - 1		
							QC 2 - 12		
							QC 2 - 14		
							QC 2 - 17		
							QC 2 - 19		
							QC 2 - 2		
							QC 2 - 20		
							QC 2 - 22		
							QC 2 - 23		
							QC 2 - 25		
							QC 2 - 32		
							QC 2 - 33		
							QC 2 - 35		
							QC 2 - 39		
							QC 2 - 4		
							QC 2 - 40		
							QC 2 - 44		
							QC 2 - 45		
							QC 2 - 48		
							QC 2 - 49		
							QC 2 - 50		
							QC 2 - 51		
							QC 2 - 52		
							QC 2 - 57		
							QC 2 - 62		
							QC 2 - 63		
							QC 2 - 8		
							QC 2 - 66		JB 12/19/12
							QC 2 - 64		

				QC 2 - 65	
				QC 2 - 5	
				QC 2 - 71	
				QC 2 - 73	
				QC 2 - 69	
				Mori Seiki TL-40 - 1 - B4B	DAS 66 2019/12/16 9-89
120	Mori Seiki TL-40 - 1 - B4B	1 pcs	12/27/19	1.00 2.38	
130	QC 2	1 pcs	12/27/19	0.00 0.00	QC 2 - 1
					QC 2 - 12
					QC 2 - 14
					QC 2 - 17
					QC 2 - 19
					QC 2 - 2
					QC 2 - 20
					QC 2 - 22
					QC 2 - 23
					QC 2 - 25
					QC 2 - 32
					QC 2 - 33
					QC 2 - 35
					QC 2 - 39
					QC 2 - 4
					QC 2 - 40
					QC 2 - 44
					QC 2 - 45
					QC 2 - 48
					QC 2 - 49
					QC 2 - 50
					QC 2 - 51
					QC 2 - 52
					QC 2 - 57
					QC 2 - 62
					QC 2 - 63
					QC 2 - 8
					QC 2 - 66
					QC 2 - 64
					QC 2 - 65
					QC 2 - 5
					QC 2 - 71
					QC 2 - 73
					QC 2 - 69
140	QC 8	1 pcs	12/27/19	0.00 0.00	QC 8 - 12
					QC 8 - 14
					QC 8 - 17
					QC 8 - 20
					QC 8 - 25
					QC 8 - 3
					QC 8 - 32
					QC 8 - 33
					QC 8 - 35
					QC 8 - 39
					QC 8 - 4
					QC 8 - 44
					QC 8 - 45
					QC 8 - 49
					QC 8 - 58
					QC 8 - 8
					QC 8 - 9
					QC 8 - 68

				QC 8 - 67	
				QC 8 - 1 (A)	DAS
				QC 8 - 47	47 19-12-19
				QC 8 - 40	9-89
				QC 8 - 52	
				QC 8 - 23	
				QC 8 - 57	
				QC 8 - 76	
				QC 8 - 61	
145 Crosstubes - 2 - B4B	1 pcs	12/27/19	0.00 0.50	Crosstubes - 1 - B4B	
				Crosstubes - 2 - B4B	
				Crosstubes - 3 - B4B	
				Crosstubes - 4 - B4B	
150 Handfinish - 1-1 Chemical-B4B	1 pcs	12/27/19	0.00 1.00	Handfinish - 1 - 1 - B4B	
				Handfinish - 1 - 2 - B4B	
				Handfinish - 1 - 3 - B4B	
				Handfinish - 1 - 4 - B4B	
				Handfinish - 1 - 5 - B4B	
				Handfinish - 1 - 6 - B4B	
				Handfinish - 1 - 7 - B4B	
				Handfinish - 1 - 8 - B4B	
				Handfinish - 1 - 9 - B4B	
				Handfinish - 1 - 10 - B4B	
				Handfinish - 1 - 11 - B4B	
				Handfinish - 1 - 12 - B4B	
				Handfinish - 1 - 13 - B4B	
				Handfinish - 1 - 14 - B4B	
				Handfinish - 1 - 15 - B4B	
				Handfinish - 1 - 16 - B4B	
				Handfinish - 1 - 17 - B4B	
				Handfinish - 1 - 18 - B4B	
				Handfinish - 1 - 19 - B4B	
				Handfinish - 1 - 20 - B4B	
				Handfinish - 1 - 21 - B4B	
				Handfinish - 1 - 22 - B4B	
160 QC 7	1 pcs	12/27/19	0.00 0.00	QC 7 - 10	
				QC 7 - 13	
				QC 7 - 14	
				QC 7 - 15	
				QC 7 - 17	
				QC 7 - 18	
				QC 7 - 19	
				QC 7 - 2	
				QC 7 - 28	
				QC 7 - 3	
				QC 7 - 30	
				QC 7 - 34	
				QC 7 - 36	

				QC 7 - 37	
				QC 7 - 41	
				QC 7 - 47	
				QC 7 - 48	
				QC 7 - 51	
				QC 7 - 58	
				QC 7 - 59	
				QC 7 - 60	
				QC 7 - 9	
				QC 7 - 68	
				QC 7 - 50	
				QC 7 - 67	
				QC 7 - 40	
				QC 7 - 24	
				QC 7 - 43	
				QC 7 - 61	DAS
				QC 7 - 81	76
				QC 7 - 76	9-89
				QC 7 - 79	
170 Packaging 3-1 - Stock - B4B	1 pcs	12/27/19	0.00 0.00	Packaging 3 - 1 - B4B	
				Packaging 3 - 2 - B4B	
				Packaging 3 - 3 - B4B	
				Packaging 3 - 4 - B4B	
				Packaging 3 - 5 - B4B	
				Packaging 3 - 6 - B4B	
				Packaging 3 - 7 - B4B	
				Packaging 3 - 8 - B4B	
				Packaging 3 - 9 - B4B	
				Packaging 3 - 10 - B4B	
				Packaging 3 - 11 - B4B	
				Packaging 3 - 12 - B4B	
				Packaging 3 - 13 - B4B	
				Packaging 3 - 14 - B4B	
				Packaging 3 - 15 - B4B	
				Packaging 3 - 16 - B4B	
				Packaging 3 - 17 - B4B	
				Packaging 3 - 18 - B4B	
				Packaging 3 - 19 - B4B	
				Packaging 3 - 20 - B4B	
				Packaging 3 - 21 - B4B	
				Packaging 3 - 22 - B4B	
				Packaging 3 - 23 - B4B	
				Packaging 3 - 24 - B4B	B3 1/6/2020
				Packaging 3 - 25 - B4B	
				Packaging 3 - 26 - B4B	
				Packaging 3 - 27 - B4B	
				Packaging 3 - 28 - B4B	
				Packaging 3 - 29 - B4B	
				Packaging 3 - 30 - B4B	
				Packaging 3 - 31 - B4B	
				Packaging 3 - 32 - B4B	
				Packaging 3 - 33 - B4B	
				Packaging 3 - 34 - B4B	
				Packaging 3 - 35 - B4B	
				Packaging 3 - 36 - B4B	
180 QC 21 - SA	1 pcs	12/27/19	0.00 0.00	QC 21 - SA - 21	DAS
				QC 21 - SA - 70	21
				QC 21 - SA - 53	9-89

Part Op 100 - (Mori Seiki CNC Lathe Large) 1- Fill tube with sand & install plugs 212-141 on both ends as per Folio FA113 3- Turn

Descriptions: first taper section on both side as per folio FA113
110 - (QC2- Inspect parts off machine FAI/FAIB) (QC2- Inspect parts off machine FAI/FAIB)
120 - (Mori Seiki CNC Lathe Large) 1- Turn second taper on both side 4- Scribe part # and batch # using vibrating stylus on the cuff as per Dwg D212-664-141
130 - (QC2- Inspect parts off machine FAI/FAIB)
140 - (QC8- Inspect parts - second check)
145 - (Crosstubes) GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.
150 - 1- Handfinish X-TUBE INSIDE AND OUT
160 - (QC7-Inspect Chemical Conversion Coat)
170 - (Identify as per dwg & Stock Location: _____ LOCATION : LG014
180 - (QC21- Final Inspection - Work Order Release)

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D6005-128	Crosstube Material	1 pcs (1 ea)	100-Mori Seiki TL-40 - 1	FL39415

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
100-Mori Seiki TL-40 - 1	D6005-128	1	8	0

Part Specifications

Specifications could not be found.



DART AEROSPACE LTD.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL.: 1 813 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

Plex 12/5/19 2:32 PM Dart.lajeunesse.marie

Container No: S239560



Part: D212-664-101TRN

Job No: 204292

Serial No/Batch: S239560

Revision: E

Inspector:

Exp Date:

Instructions:

Date: 12/11/19

⑥

DART AEROSPACE LTD	Work Order: 204292	
Description: Crosstube Assembly (205/212/412 High Fwd)	Part Number: D212-664-141	
Inspection Dwg: D212-664-141 Rev: E		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	.209	✓		CNC-08	
	R0.063	+/-0.010	.063	✓		RG	
	2.740	+0.005/-0.000	2.736		✓	CNC-04	OK JTW
	5.097	+/-0.030	5.097	✓		CNC-08	
	2.304	+0.005/-0.000	2.308	✓		CNC-04	
	2.340	+0.005/-0.000	2.345	✓			
	2.398	+0.005/-0.000	2.403	✓			
	2.448	+0.005/-0.000	2.453	✓			
	2.498	+0.005/-0.000	2.503	✓			
	2.549	+0.005/-0.000	2.554	✓			
	2.599	+0.005/-0.000	2.604	✓			
	2.671	+0.005/-0.000	2.676	✓			
	2.701	+0.005/-0.000	2.704	✓			
SIDE B	0.200	+/-0.010	.208	✓		CNC-08	
	R0.063	+/-0.010	.063	✓		RG	
	2.740	+0.005/-0.000	2.741	✓		CNC-04	
	5.097	+/-0.030	5.097	✓		CNC-08	
	2.304	+0.005/-0.000	2.308	✓		CNC-04	
	2.340	+0.005/-0.000	2.345	✓			
	2.398	+0.005/-0.000	2.405		✓		OK JTW
	2.448	+0.005/-0.000	2.455		✓		OK JTW
	2.498	+0.005/-0.000	2.504		✓		OK JTW
	2.549	+0.005/-0.000	2.554	✓			
	2.599	+0.005/-0.000	2.604	✓			
	2.671	+0.005/-0.000	2.676	✓			
	2.701	+0.005/-0.000	2.706	✓			
	126.514	+/-0.020	126.510	✓		Tape	

Item	Qty -141	Qty -141B	Qty -141F	Part Number	Description
1	X			D212-884-141	CROSS TUBE ASSEMBLY (205/212/12412 HIGH FWD)
2		X		D212-884-141B	CROSS TUBE ASSEMBLY (214 HIGH FWD)
3			X	D212-884-141F	CROSS TUBE ASSEMBLY (205/212/12412 HIGH FWD) (ANODIZED)
4	1	1	1	D6006-128	CROSS TUBE
5	2		2	D2883-1	SUPPORT
6	4	4	4	D3565-063-450	RUBBER CUSHION
7		2		D6017-1	SUPPORT
8	4	4	4	MS21920-25	CLAMP (OR MS21920-28)
9	A/R	A/R	A/R	PROSEAL 880 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.5144±0.020
- FINISH -141 & -141B: a) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
b) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
c) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C8-2 / C8-3, HATCHED AREA)
d) PAINT OUTSIDE PER DART QSI 005 4.2
e) REMOVE MASKING AND APPLY MATTE CLEAR COAT
FINISH -141F: a) ANODIZE PER MIL-A-8625, TYPE II, CLASS 1
b) ALODINE (DO NOT ETCH) PER QSI 005 4.1, 2
c) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
d) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C8-2 / C8-3, HATCHED AREA)
e) PAINT OUTSIDE PER DART QSI 005 4.2
f) REMOVE MASKING AND APPLY MATTE CLEAR COAT
*NOTE: BETWEEN FINISHING OPERATIONS EXTREME CARE MUST BE TAKEN NOT TO CONTAMINATE OR DAMAGE FINISHED SURFACES.
TOLERANCES ARE PER DART QSI D18 UNLESS OTHERWISE NOTED.
4) UNITS: INCHES UNLESS OTHERWISE NOTED.
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-884-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS
7) WEIGHT: D212-884-141/141B/141F = 33.9 lbs
8) PART IS SYMMETRIC ABOUT CENTERLINE.
9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
MACHINING
10) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
BENDING
11) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7.2% (BASED ON O.D.) IN LOWER HALF OF R35.5 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
12) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

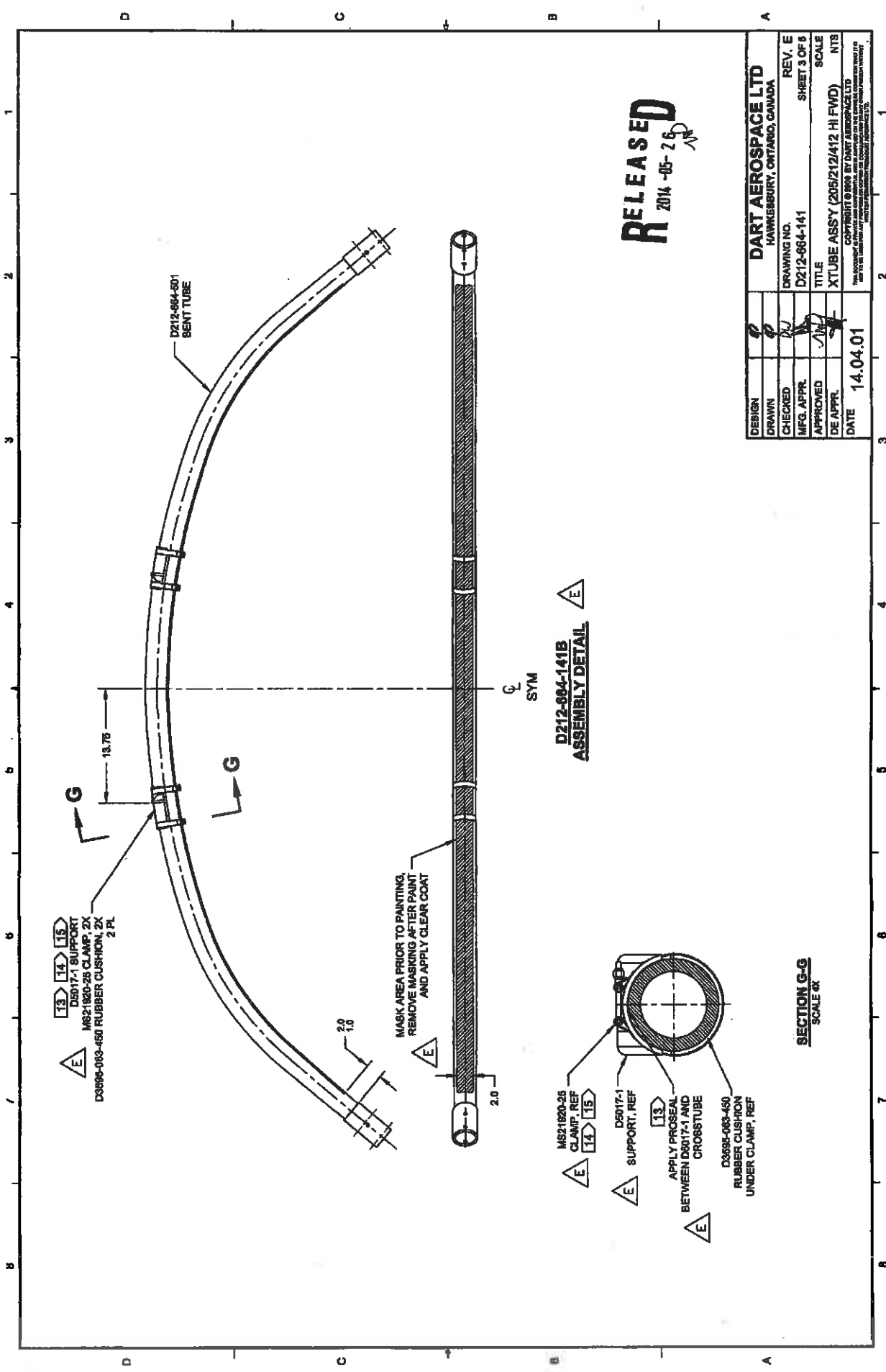
ASSEMBLY

- TO INSTALL D2883-1 / D6017-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 880 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- INSTALL MS21920-25 CLAMPS (OR -28) WITH D3565-063-450 RUBBER CUSHIONS TO SECURE THE SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 880 SEALANT HAS CURED FOR 72 HOURS.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 204292-115
19-42-05

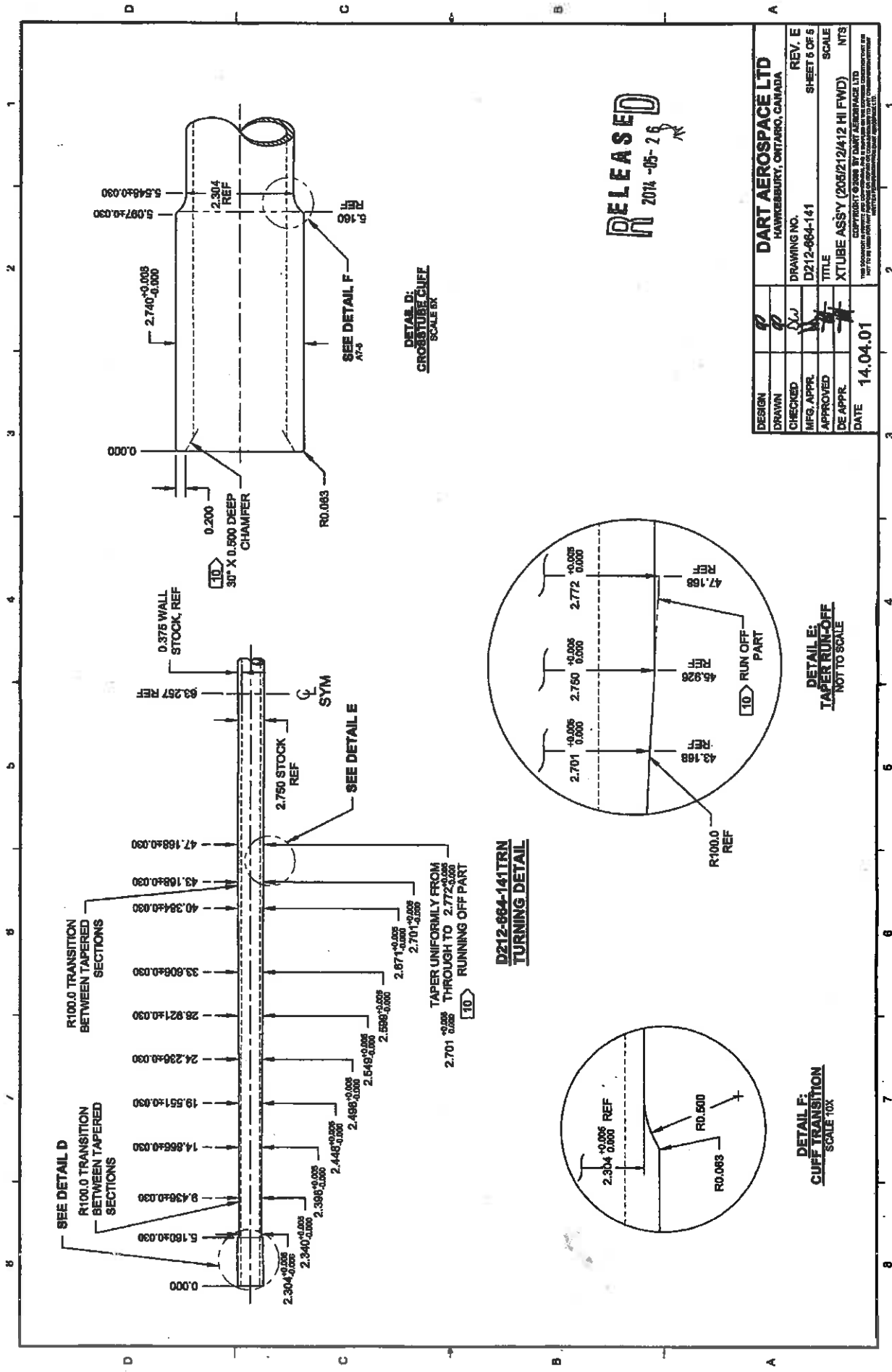
RELEASED
N 2014-05-26
JND

E	ADD -141F. D6017-1 WAS D2883-1 (-141B). PROSEAL WAS MAGNABOND. NOTE 2: ADD INSPECTION WINDOW, NOTE 11: ALLOW 7.2% GRIND, NOTE 15: ADD 72HR CURE AND RETORQUE FOR PROSEAL. ADD SHEET 3, CLAMPS REVERSED TO PREVENT CHAFING (B7-2, B7-3). BEND HEIGHT TOL. NOW 0.25 WAS 0.15 (C1-3). IN CORP. DEO D-1/2-3	CP	14.04.01
D	REFORMAT/REVISE GENERAL NOTES/PART LIST. REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. ADD -141B (ZN B4-2, D4-2). REMOVED REF & ADD TOLERANCES (ZN B4-3, C8-3 & B5-3). RELOCATED FLAG #1 PER PAR D6-040 (ZN A5-3). MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	08.03.30
C	REMOVE 451 ABRASION STRIP. ADD MAGNABOND 688A CUSHION. REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATIBILITY WITH BHTAA	PH	05.02.04
A	NEW ISSUE	CP	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR			
APPROVED			
DE APPR			
DATE	14.04.01		
DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA			
DRAWING NO. D212-884-141			
SHEET 1 OF 5			
TITLE XTUBE ASSY (205/212/12 HI FWD)			
SCALE NTS			
COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DRAWING IS THE PROPERTY OF DART AEROSPACE LTD. IT IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED THEREIN. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION IN WRITING FROM DART AEROSPACE LTD.			



RELEASED
2014-05-26 *ND*

DESIGN		DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
DRAWN	☒	REV. E
CHECKED	☒	SHEET 3 OF 4
MFG. APPR.	☒	TITLE
APPROVED	☒	XJUBE ASSY (205/212/412 HI FWD)
DE APPR.	☒	NTS
DATE	14.04.01	COPYRIGHT © 2000 BY DART AEROSPACE LTD This drawing is the property of Dart Aerospace Ltd. It is to be used for manufacturing purposes only. No other use or reproduction without written permission is permitted.



RELEASED
2014-05-26

Job: _____		DISPOSITION		DEPARTMENT/PROCESS											
Part No. _____		Rework Scrap Use-as-is		Skid-tube Machining Large Fab		Cross tube Small Fab Finishing		Eng. (Non-AW) Prod. Eng. Coord. Rec/Store/Packaging		Engineering Water Jet Supplier Quality					
Date :	Sequence #:	QTY Affected :		MRB (QS1042)											
Description Work Order Deviation				Disposition											
Root Cause Operator Manufacturing Process Equip/Tooling Handling/Preservation Material Product Improvement Process Improvement Human Factors				FAULT CATEGORY											
				Pressure/Forced Bending Crushing Cracks Crimp/Kink/Ripple/Wave/Twist Marks/Chatter Mislabeled Other/Details:				Contamination Misaligned/off center BOM/Route Broken/Damage/Defect Incomplete/Unclear Instructions Drill Holes Fit/Function				Power Loss/Surge Folio/Program Grain Direction Weld Wrong Stock Pulled Out of Sequence Off-set/Set-up			
				Completed By											
				Lead hand / Supervisor											
				QC / QA Coordinator											